

- Visualisation of SDT Service Description Tables
- Visualisation of NIT Network Information Tables
- Visualisation of MIP Mega-frame Initialisation Packets
- Visualisation of PID Packet Identifiers and associated bit-rates
- Visualisation of bit stuffing
- Visualisation of time repetition intervals of tables defined in TR.101.290
- Analysis and visualisation of first, second, and third priority errors according to TR.101.290

4T2 Content-Analyser measurement parameters (contd.)



- Measurement of PCR Program Clock Reference jitter
- Content decoding, including MPEG-4, H.264 high definition material
- Detection of black and freeze conditions on services in the transport stream
- Detection of audio mute condition on services in the transport stream
- Registration of 60 seconds of Transport Stream to HDD in presence of errors
- Measurement of two Transport Stream sources (multiple instances of the program can run at the same time)
- Remote capability with full SNMP support following the DVB MIB, including Traps

Comprehensive input options supported

- Network stream input for udp packets
- Transport stream File input
- ABC XTASI ASI to USB interface
- ABC receiver hardware (includes RF-measurements)
- BDA interface

4T2 :: Content Analyser - RF In

Input | TR 101 290 | SI Tables | Services / PIDs | Video Analysis | Table Distribution | PCR Distribution | PCR Jitter Distribution | Stream Capture | Log | About

None | License type: Demo | Free license... | Clear...

IP / UDP | Info / Settings | IP: 127.0.0.1 Port: 1001 | Edit...

File | Info / Settings | "Y:\Transport Streams_Australia\SY5CH34.ts" PCRPID: 102 | Edit...

XTASI | Info / Settings | Raw data | Edit...

Richthofenstr 29, Hildesheim, www.4T2.eu

20.08.2010 13:16:39 SW 0.0.44.69 IP 192.168.1.111

TS ID 768 (0x0300) PIDs 29 Services 6 "SBS HD", "SBS DIGITAL 1", "SB: Prio.

File: "Y:\Transport Streams_Australia\SY5CH34.ts" PCRPID: 102

Status **Synchronised** Input data rate 19.37 Mb/s Stream data rate 19.71 Mb/s Packet length 188 Priority: 1. 2. 3. Other CPU **54%**

Stream data rate

Stream	19.71 Mb/s
Payload	18.81 Mb/s 95.5 %
Stuffing	0.89 Mb/s 4.5 %

Comprehensive Tr.101.290 analysis

- first, second, and third priority error tests described in TR.101.290
- individual error event checking can be activated or deactivated
- comments on the right hand side together with date and time of occurrence are logged to file and announced through the SNMP interface
- overall number of errors and time of last error is displayed
- the errors are grouped into categories which in turn can be activated or deactivated in full

The screenshot displays the 4T2 Content Analyser - RF In software interface. The main window shows a tree view of error categories and indicators for TR 101 290. The table below summarizes the data shown in the interface:

Category	Indicator	# Errors	Time of Last Error	Error Message
TR 101 290	1	0	20.08.2010 13:15:51	First priority
1	1.1	0	20.08.2010 13:16:46	TS_sync_loss
1	1.2			Sync_byte_error
1	1.3.a			PAT_error_2
1	1.4			Continuity_count_error
1	1.5.a			PMT_error_2
1	1.6			PID_error
2	2	44	20.08.2010 13:16:47	Second priority
2	2.1			Transport_error
2	2.2			CRC_error
2	2.3	22	20.08.2010 13:16:47	PCR_error
2	2.3.a	22	20.08.2010 13:16:47	PCR_repetition_error
2	2.3.b			PCR_discontinuity_indic...
2	2.4			PCR_accuracy_error
2	2.5			PTS_error
2	2.6			CAT_error
3	3			Third priority
3	3.1			NIT_error
3	3.1.a			NIT_actual_error
3	3.1.b			NIT_other_error
3	3.2			SI_repetition_error
3	3.3			Buffer_error
3	3.4.a			Unreferenced_PID
3	3.5			SDT_error
3	3.5.a			SDT_actual_error
3	3.5.b			SDT_other_error
3	3.6			EIT_error
3	3.6.a			EIT_actual_error
3	3.6.b			EIT_other_error
3	3.6.c			EIT_PF_error

The interface also shows a status bar at the bottom with the following information:

- Status: Synchronised
- Input data rate: 19.20 Mb/s
- Stream data rate: 19.56 Mb/s
- Packet length: 188
- Priority: 1 (Green), 2 (Yellow), 3 (Grey), Other (Grey)
- CPU: 55%

A stream data rate graph is visible in the bottom right corner, showing Stream (19.56 Mb/s), Payload (18.76 Mb/s, 95.9%), and Stuffing (0.80 Mb/s, 4.1%).

Service Information decoding and analysis

- displays the full content of Service Information that is embedded in the Transport Stream
- the display is arranged in an Explorer-like fashion
- in order to find specific information in the vast amount of data transmitted, a find-function is employed

The screenshot displays the 4T2 Content Analyser software interface. The main window shows a tree view of Service Information (SI) tables, including PAT, PMT, and Section Data. The Section Data section is expanded, showing a list of hex values and their corresponding ASCII representations. The interface also includes a search bar, a status bar, and a stream data rate graph.

Section Data:

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00 : 02 B0 3E 03 02 F3 00 00 E0 A2 F0 00 02 E0 A2 F0  .°>..ó..àçð..àçð
0F : 09 0A 04 65 6E 67 00 52 01 01 03 E0 53 F0 09 0A  ...eng.R...àSð..
1F : 04 65 6E 67 01 52 01 02 06 E0 2A F0 10 0A 04 65  .eng.R...à*ð....
2F : 6E 67 00 52 01 06 56 05 65 6E 67 10 01 38 B9 05  ng.R..V.eng..8'.
3F : EE                                     i
  
```

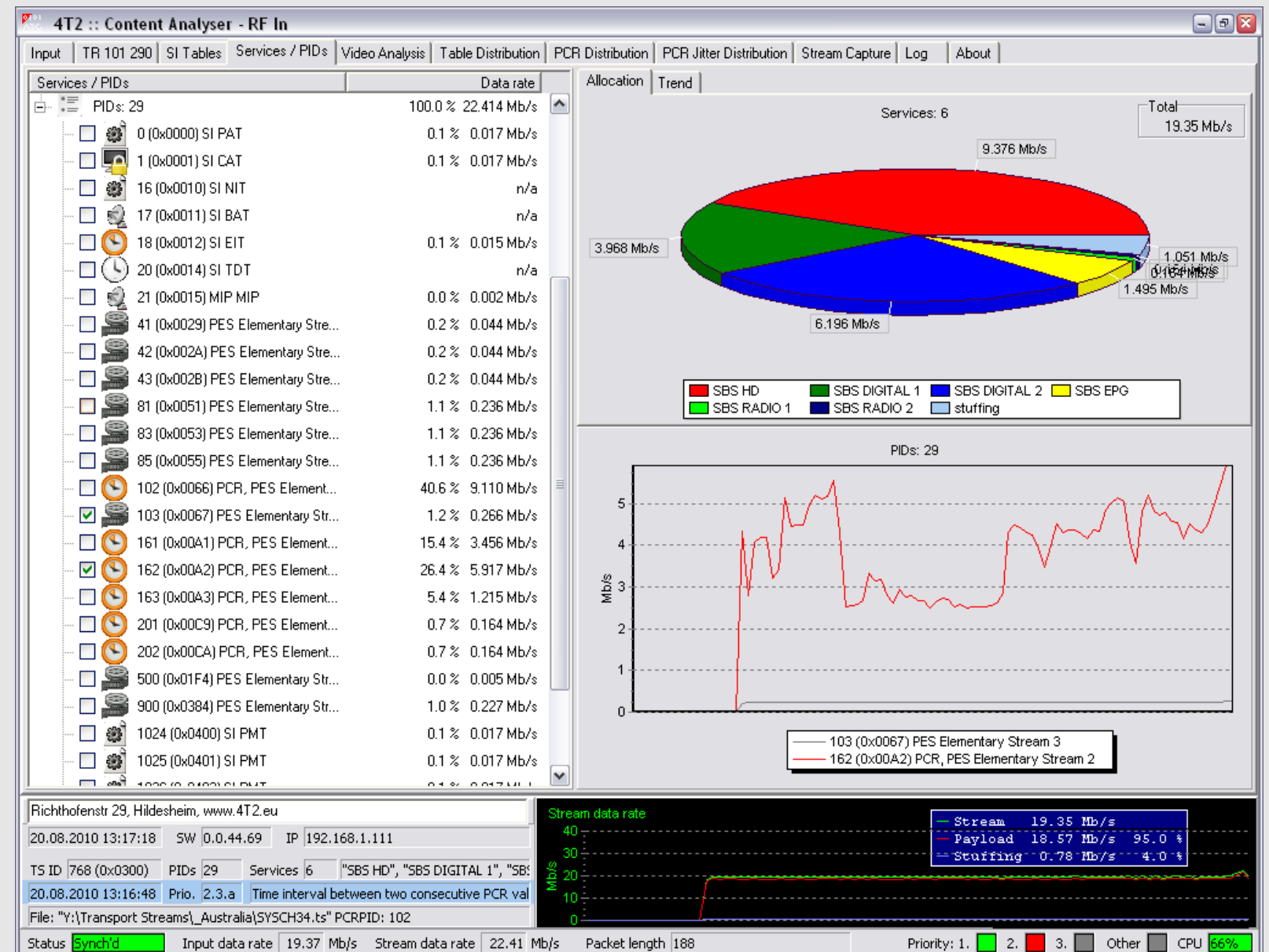
Stream data rate graph:

Category	Value	Percentage
Stream	19.14 Mb/s	-
Payload	18.36 Mb/s	95.9 %
Stuffing	0.78 Mb/s	4.1 %

Status Bar: Status: Synchronised, Input data rate: 19.38 Mb/s, Stream data rate: 19.14 Mb/s, Packet length: 188, Priority: 1, 2, 3, Other, CPU: 67%

Data-rates of services and PIDs with trend-line

- Transport Stream content is displayed as services and packet identifiers
- individual services are shown with name and identifier, both in decimal and hexadecimal notation
- data-rates of the services are displayed in Mega-bits per second, and as a percentage of the overall payload.
- pie-chart for quick evaluation of the services allocation. A second display allows to follow the trend of the services distribution.



Visualisation, black/freeze, and mute detectors

- comprehensive video analysis of the Transport Stream
- each individual program is shown with its name and identifier, both in decimal and hexadecimal notation
- thumbnails of video content, decoding of MPEG-4 in HD
- information on the elementary-stream decoders, including frame-rates, spatial, and coding resolutions
- audio bar-graphs show the loudness of left/right, front/rear, and center channels
- black- and freeze-frame detectors

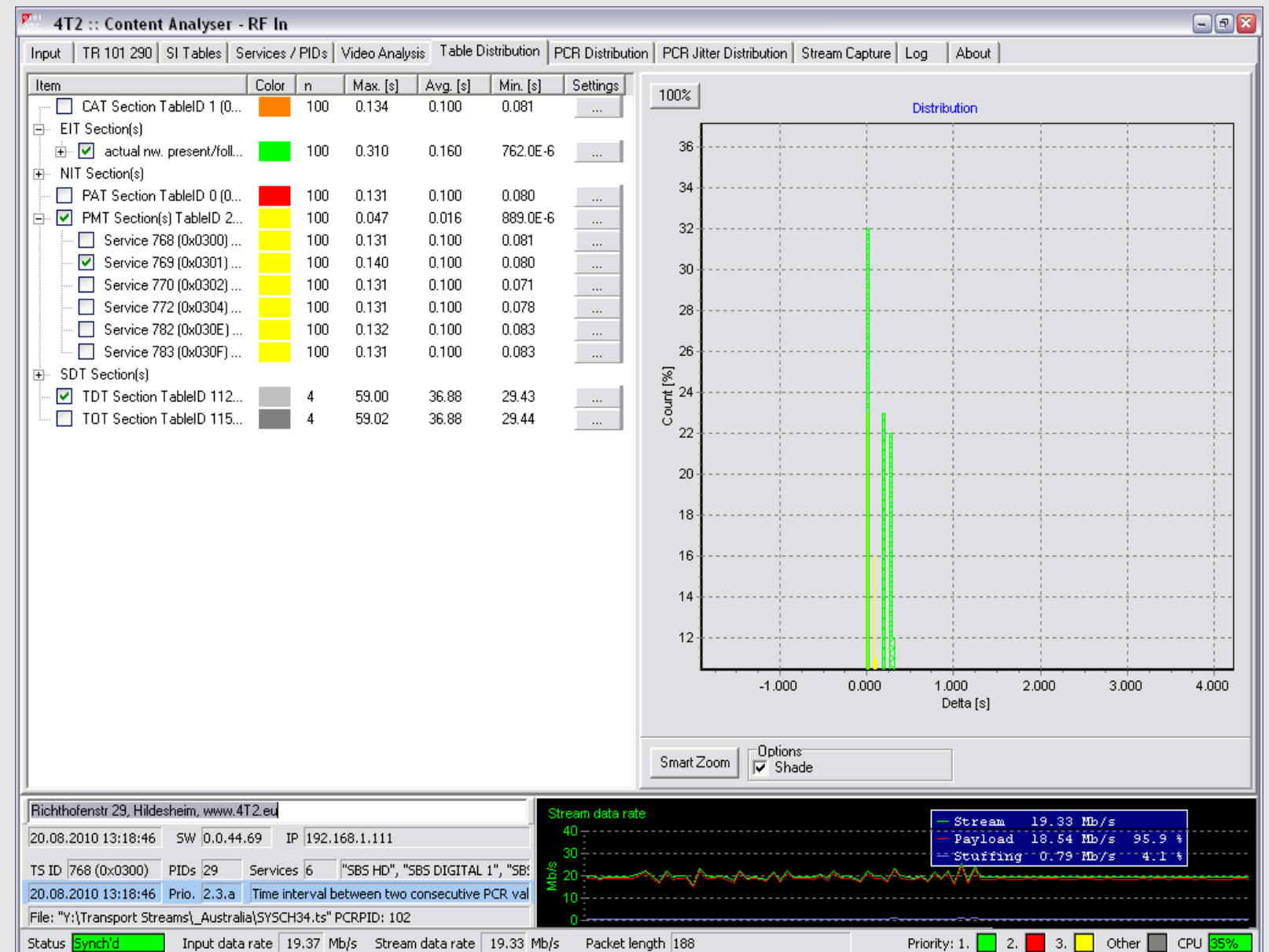
The screenshot displays the 4T2 Content Analyser software interface. The main window shows a video stream of a woman speaking in front of green foliage. The interface includes a menu bar with options like 'Input', 'TR 101 290', 'SI Tables', 'Services / PIDs', 'Video Analysis', 'Table Distribution', 'PCR Distribution', 'PCR Jitter Distribution', 'Stream Capture', 'Log', and 'About'. Below the menu, there are tabs for '768 (0x300) SBS HD', '769 (0x301) SBS DIGITAL 1', and '770 (0x302) SBS DIGITAL 2'. The '768 (0x300) SBS HD' tab is active, showing a video player with a 'decoding' button and a '768 (0x300) SBS HD' label. To the right of the video player, there are tabs for 'Video', 'Video Analysis', and 'Audio'. Below these tabs, the text 'program analysis active' is visible. At the bottom of the window, there is a status bar with the following information: 'Richthofenstr 29, Hildesheim, www.4T2.eu', '20.08.2010 13:16:30 SW 0.0.44.69 IP 192.168.1.111', 'TS ID 768 (0x0300) PIDs 29 Services 6 "SBS HD", "SBS DIGITAL 1", "SBS DIGITAL 2"', 'File: "Y:\Transport Streams\Australia\SY5CH34.ts" PCRPID: 102', 'Status Synchronised', 'Input data rate 19.37 Mb/s', 'Stream data rate 19.47 Mb/s', 'Packet length 188', 'Priority: 1. 2. 3. Other CPU 45%'. A 'Stream data rate' graph is also visible, showing a line graph with a legend: 'Stream 19.47 Mb/s', 'Payload 18.67 Mb/s 95.9%', and 'Stuffing 0.79 Mb/s 4.1%'.

Visualisation, black/freeze, and mute detectors

- comprehensive video analysis of the Transport Stream
- each individual program is shown with its name and identifier, both in decimal and hexadecimal notation
- thumbnails of video content, decoding of MPEG-4 in HD
- information on the elementary-stream decoders, including frame-rates, spatial, and coding resolutions
- audio bar-graphs show the loudness of left/right, front/rear, and center channels
- black- and freeze-frame detectors



- comprehensive analysis of the distribution of service information tables in the Transport Stream
- selection is arranged through individual services
- individual tables can be selected and the repetition rates are displayed in form of a histogram
- smart zoom assists on positioning the histograms



- transport stream recording triggered by error events
- manual recording
- 60 seconds worth of transport stream kept in memory to provide a history that has led to the error event
- selectable limit of file-size, or the recording time of a single event

The screenshot shows the '4T2 :: Content Analyser - RF In' application window. The 'Stream Capture' tab is active, displaying various configuration options:

- Active:** Checked
- Capture stream on... error event:**
 - First Priority
 - Second Priority
 - Third Priority
- ... user specific:**
 - Manual
- File limits:**
 - Max. single file size: 1.0 GByte (Set)
 - Max. folder file size: 2.0 GByte (Set)
- Time limits:**
 - Time before first error event: 10.0 sec (Set)
 - Time after last error event: 10.0 sec (Set)

Below the settings, there is a status bar with the following information:

- Pre-buffering (s): 9.9
- File status: waiting
- File size (GB): n/a
- total size captured streams (GB):

At the bottom, there is a detailed status section and a 'Stream data rate' graph:

- Address: Richthofenstr 29, Hildesheim, www.4T2.eu
- Timestamp: 20.08.2010 13:17:47 SW 0.0.44.69 IP 192.168.1.111
- TS ID: 768 (0x0300) PIDs: 29 Services: 6 "SBS HD", "SBS DIGITAL 1", "SB:"
- Event: 20.08.2010 13:16:48 Prio. 2.3.a Time interval between two consecutive PCR val
- File: "Y:\Transport Streams\Australia\SY5CH34.ts" PCRPID: 102
- Status: Synchronised
- Input data rate: 19.36 Mb/s
- Stream data rate: 19.23 Mb/s
- Packet length: 188
- Priority: 1 (Green), 2 (Red), 3 (Grey), Other (Grey)
- CPU: 63%

The 'Stream data rate' graph shows three data series over time:

- Stream: 19.23 Mb/s
- Payload: 18.45 Mb/s (95.9%)
- Stuffing: 0.78 Mb/s (4.1%)

Please find further information under

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